LISTING OF CLAIMS

This listing of claims below will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1.(Currently amended) A method of measuring an amount of an organic substance contained within a food product, said organic substance having an infrared absorption spectrum which includes a set (n) of ~~wavelength regions~~ infrared absorption bands, wherein each of said ~~wavelength regions~~ infrared absorption bands substantially corresponds to ~~an absorption band~~ a wavelength band defined by a range of wavelengths of said infrared absorption spectrum, the method comprising:

(a) detecting the intensity ~~of a number of selected wavelength bands~~ of infrared electromagnetic radiation influenced by said organic substance ~~contained within said food product with a detection system, wherein (i) each of said selected wavelength bands substantially corresponds to one of said wavelength regions and (ii) said number of said selected wavelength bands is equal to n-1 or less~~ in ranges of wavelengths corresponding to each of a subset of said (n) wavelength bands;

(b) generating an electrical signal in response to detecting the intensity of infrared electromagnetic radiation influenced by said organic substance in ranges of wavelengths corresponding to each of said ~~number~~ subset of said ~~selected~~ (n) wavelength bands;

~~(c) receiving said electrical signals with a signal processor configured to process said electrical signal with a quantification algorithm;~~ and

~~(d)~~ (c) processing said electrical signals with ~~said~~ a quantification algorithm so as to provide a measurement of said amount of said organic substance contained within said food product.

2.(Original) The method of claim 1, wherein:

said quantification algorithm of (c) includes dividing a first wavelength band integrated absorbance value by a reference wavelength band integrated absorbance value.

3.(Currently amended) The method of claim 1, wherein:

(a) includes detecting the intensity of (i) about a 905 - 930 cm^{-1} wavelength band of infrared electromagnetic radiation and (ii) about a 880 - 890 cm^{-1} reference wavelength band of infrared electromagnetic radiation.

4.(Currently amended) The method of claim 1, wherein:

(a) includes detecting the intensity of (i) about a 2905 - 2945 cm^{-1} wavelength band of infrared electromagnetic radiation ~~and~~ and/or (ii) about a 2840 - 2870 cm^{-1} wavelength band of infrared electromagnetic radiation.

5.(Currently amended) The method of claim 1, wherein:

said ~~number~~ subset of ~~selected infrared~~ said (n) wavelength bands of (a) ~~are~~ is within a range defined by 800 - 1000 cm^{-1}.

6.(Currently amended) The method of claim 1, wherein:

said ~~number~~ subset of ~~selected infrared~~ said (n) wavelength bands of (a) ~~are~~ is within a range defined by 2800 - 3000 cm^{-1}.

7.(Currently amended) A method of measuring an amount of a vegetable seed oil in a food product, wherein said vegetable seed oil has an infrared absorption spectrum which includes a set (n) of infrared ~~wavelength regions~~ absorption bands, wherein each of said infrared ~~wavelength regions~~ absorption bands substantially corresponds to ~~an infrared absorption~~ a wavelength band defined by a range of wavelengths of said infrared absorption spectrum, the method comprising:

(a) detecting the ~~transmittance of a number of selected wavelength bands~~ intensity of infrared electromagnetic radiation ~~absorbed~~ influenced by said vegetable seed oil ~~contained within said food product with a detection system, wherein (i) each of said selected wavelength bands substantially corresponds to one of said wavelength regions and (ii) said number of said selected wavelength bands is equal to n-1 or less~~ in ranges of wavelengths corresponding to each of a subset of said (n) wavelength bands;

(b) generating an electrical signal in response to detecting the ~~transmittance~~ intensity of said infrared electromagnetic radiation influenced by said vegetable seed oil in ranges of wavelengths corresponding to each of said subset of said (n) wavelength bands;

~~(c) receiving said electrical signal with a signal processor configured to process said electrical signal with a quantification algorithm;~~ and

~~(d)~~ (c) processing said electrical signals with ~~said~~ a quantification algorithm so as to provide a measurement of said amount of said vegetable seed oil contained within said food product.

8.(Original) The method of claim 7, wherein:

said quantification algorithm of (c) includes dividing a first wavelength band integrated absorbance value by a reference wavelength band integrated absorbance value.

9.(Currently amended) The method of claim 7, wherein:

(a) includes detecting the ~~transmittance~~ intensity of (i) about a 905 - 930 cm^{-1} wavelength band of infrared electromagnetic radiation and (ii) about a 880 - 890 cm^{-1} reference wavelength band of infrared electromagnetic radiation.

10.(Currently amended) The method of claim 7, wherein:

said ~~number~~ subset of ~~selected infrared~~ said (n) wavelength bands of (a) ~~are~~ is within a range defined by 800 - 1000 cm^{-1}.

11.(Original) The method of claim 7, wherein:

said food product includes olive oil.

12.(Currently amended) A method of measuring an amount of milk fat in a food product, wherein said milk fat has an infrared absorption spectrum which includes a set (n) of infrared ~~wavelength regions~~ absorption bands, wherein each of said infrared ~~wavelength regions~~ absorption bands substantially corresponds to ~~an infrared absorption~~ a wavelength band defined by a range of wavelengths of said infrared absorption spectrum, the method comprising:

(a) detecting the ~~transmittance of a number of selected wavelength bands~~ intensity of infrared electromagnetic radiation ~~absorbed~~ influenced by said milk fat ~~contained within said food product with a detection system, wherein (i) each of said selected wavelength bands substantially corresponds to one of said wavelength regions and (ii) said number of said selected wavelength bands is equal to n-1 or less~~ in ranges of wavelengths corresponding to each of a subset of said (n) wavelength bands;

(b) generating an electrical signal in response to detecting the ~~transmittance~~ intensity of said infrared electromagnetic radiation influenced by said milk fat in ranges of wavelengths corresponding to each of said subset of said (n) wavelength bands;

~~(c) receiving said electrical signal with a signal processor configured to process said electrical signal with a quantification algorithm;~~ and

~~(d)~~ (c) processing said electrical signals with ~~said~~ a quantification algorithm so as to provide a measurement of said amount of said milk fat contained within said food product.

13.(Currently amended) The method of claim 12, wherein:

(a) includes detecting the ~~transmittance~~ intensity of ~~(i)~~ about a 2905 - 2945 cm^{-1} wavelength band of infrared electromagnetic radiation.

14.(Currently amended) The method of claim 12, wherein:

(a) includes detecting the ~~transmittance~~ intensity of ~~(i)~~ about a 2840 - 2870 cm^{-1} wavelength band of infrared electromagnetic radiation.

15.(Currently amended) The method of claim 12, wherein:

said ~~number~~ subset of ~~selected infrared~~ said (n) wavelength bands of (a) ~~are~~ is within a range defined by 2800 - 3000 cm^{-1}.

16.(Original) The method of claim 12, wherein:

said food product includes milk.

17.(Currently amended) A method of measuring a concentration of an organic substance contained within a food product, said organic substance having an infrared absorption spectrum which includes a set (n) of infrared ~~wavelength regions~~ absorption bands and one or more reference wavelengths bands, wherein ~~each of said infrared wavelength regions substantially correspond to an absorption band of said infrared absorption spectrum~~ said organic substance does not substantially absorb said infrared electromagnetic radiation in said one or more reference wavelength bands, the method comprising:

(a) detecting the ~~transmittance of a number of selected wavelength bands~~ intensity of infrared electromagnetic radiation ~~absorbed~~ influenced by said organic substance ~~contained within said food product with a detection system, wherein (i) each of said selected wavelength bands substantially corresponds to one of said wavelength regions and (ii) said number of said selected wavelength bands is equal to n-1 or less~~ in ranges of wavelengths corresponding to each of a subset of said (n) infrared absorption bands and in ranges of wavelengths corresponding to each of a subset of said one or more reference wavelength bands to provide electrical signals corresponding thereto;

~~(b) generating an electrical signal in response to detecting the transmittance of said selected infrared electromagnetic radiation wavelength bands;~~

~~(c) receiving said electrical signal with a signal processor configured to process said electrical signal with a mathematical model;~~ and

~~(d)~~ (b) processing said electrical signals with ~~said~~ a mathematical model so as to provide a measurement of the concentration of said organic substance contained within said food product.

18.(Currently amended) The method of claim 17, wherein:

(a) includes detecting the ~~transmittance~~ intensity of said ~~selected~~ infrared electromagnetic radiation ~~wavelength bands absorbed~~ influenced by a vegetable seed oil contained within said food product ~~with said detection system~~ .

19.(Currently amended) The method of claim 17, wherein:

(a) includes detecting the ~~transmittance~~ intensity of said ~~selected~~ infrared electromagnetic radiation ~~wavelength bands absorbed~~ influenced by milk fat contained within said food product ~~with said detection system~~ .

20.(Currently amended) The method of claim 17, wherein:

said mathematical model of ~~(c)~~ (b) includes dividing ~~a first wavelength band~~ an integrated absorbance value of one of said subset of said absorption bands by ~~a~~ an integrated

absorbance value of one of said subset of said reference wavelength bands ~~integrated absorbance value~~ .

21.(Currently amended) The method of claim 17, wherein:

said mathematical model of (b) includes the mathematical equation

$C_f = P_0 + P_1 IA_{\lambda,1}$

where (i) C_f is a mean-centered known concentration of milk fat in a food product, (ii) P_i are calibration constants, and (iii) $IA_{\lambda,1}$ is a mean-centered integrated absorbance occurring in a selected wavelength band.

22.(Currently amended) A method of measuring an amount of an organic substance contained within a food product, said organic substance having an infrared absorption spectrum which includes a set (n) of ~~wavelength regions~~ infrared absorption bands, ~~wherein each of said wavelength regions substantially correspond to an absorption band of said absorption spectrum,~~ the method comprising:

(a) illuminating said food product with infrared electromagnetic radiation from an IR source ~~, wherein said infrared electromagnetic radiation includes one or more wavelength bands of said infrared electromagnetic radiation which are absorbed by said organic substance contained within said food product~~;

(b) ~~selecting a number of said wavelength bands of said infrared electromagnetic radiation, wherein (i) each of said selected wavelength bands substantially corresponds to one of said wavelength regions and (ii) said number of said selected wavelength bands is a subset of (n)~~ passing infrared electromagnetic radiation influenced by said organic substance through a filter so that only electromagnetic radiation in ranges of wavelengths corresponding to a subset of said (n) infrared absorption bands is allowed to pass to a detector;

(c) detecting the intensity of ~~only (i) said subset of said selected wavelength bands absorbed by said organic substance contained within said food product with a detection system and (ii) said number of reference wavelength bands~~ infrared electromagnetic radiation passing through said filter to provide electrical signals corresponding to each of said subset of said (n) wavelength bands;

~~(d) generating one or more electrical signals in response to detecting the intensity of only said subset of said selected wavelength bands;~~

~~(e) receiving said one or more electrical signals with a signal processor configured to process said electrical signals with a quantification algorithm;~~ and

~~(f)~~ (d) processing said ~~one or more~~ electrical signals with ~~said~~ a quantification algorithm so as to provide a measurement of said amount of said organic substance contained within said food product.

23.(Currently amended) A method of measuring an amount of an organic substance contained within a food product, said organic substance having an infrared absorption spectrum which includes a set (n) of wavelength regions, wherein each of said wavelength regions substantially correspond to an absorption band of said absorption spectrum, comprising:

(a) illuminating said food product with infrared electromagnetic radiation;

(b) detecting the intensity of said infrared electromagnetic radiation that is absorbed by said organic substance contained within said food product, wherein (i) said intensity detection is restricted to a number of selected wavelength bands of infrared electromagnetic radiation, (ii) each of said selected wavelength bands substantially corresponds to one of said wavelength regions, and (iii) said number of said selected wavelength bands is a subset of (n);

(c) generating an electrical signal in response to detecting the intensity of said subset of said selected wavelength bands;

(d) receiving said electrical signal with a signal processor configured to process said electrical signal with a quantification algorithm; and

(e) processing said electrical signal with said quantification algorithm so as to provide a measurement of said amount of said organic substance contained within said food product,

wherein (b) includes detecting the intensity of one or more reference wavelengths bands of said infrared electromagnetic radiation which are not substantially absorbed by said organic substance contained within said food product,

wherein (c) includes generating said electrical signal in response to detecting the intensity of said one or more reference wavelength bands.

24.(Currently amended) The method of ~~claim 23~~ claim 25, ~~further comprising:~~

~~(f) detecting the intensity of one or more reference wavelengths bands of said infrared electromagnetic radiation which are not substantially absorbed by said organic substance contained within said food product,~~

~~wherein (c) includes generating said electrical signal in response to detecting the intensity of said one or more reference wavelength bands~~

wherein said quantification algorithm includes dividing an integrated absorbance value of said one of said absorption bands by an integrated absorbance value of said one of said reference wavelength bands.

25.(Currently amended) A method of measuring an amount of an organic substance contained within a food product, said organic substance having an infrared absorption spectrum which includes a set (n) of ~~wavelength regions~~ infrared absorption bands and one or more reference wavelengths bands, wherein ~~each of said wavelength regions substantially~~

~~correspond to an absorption band of said absorption spectrum~~ said organic substance does not substantially absorb said infrared electromagnetic radiation in said one or more reference wavelength bands, the method comprising:

(a) illuminating said food product with infrared electromagnetic radiation from an IR source ~~, wherein said infrared electromagnetic radiation includes one or more wavelength bands of said infrared electromagnetic radiation which are absorbed by said organic substance contained within said food product~~ ;

~~(b) selecting a number of said wavelength bands of said infrared electromagnetic radiation, wherein (i) each of said selected wavelength bands substantially corresponds to one of said wavelength regions and (ii) said number of said selected wavelength bands is a subset of (n);~~

~~(c)~~ (b) detecting ~~with a detection system~~ the intensity of said infrared electromagnetic radiation influenced by said organic substance in a range of wavelengths corresponding to one of said absorption bands and a range of wavelengths corresponding to one of said reference wavelength bands to provide electrical signals corresponding thereto; and

~~(d)~~ (c) processing said electrical signals with a mathematical model ~~spectral data only from said subset of said selected wavelength bands absorbed by~~ to provide a measurement of said amount of said organic substance contained within said food product.

26.(New) An apparatus for measuring an amount of an organic substance contained within a food product, said organic substance having an infrared absorption spectrum which includes a set (n) of infrared absorption bands, wherein each of said absorption bands substantially corresponds to a wavelength band defined by a range of wavelengths of said infrared absorption spectrum, the apparatus comprising

(a) a detector operable to detect the intensity of infrared electromagnetic radiation influenced by said organic substance in ranges of wavelengths corresponding to each of a subset of said (n) wavelength bands to provide an electrical signal corresponding to each of said subset of said (n) wavelength bands; and

(b) a processor operable to process said electrical signals with a quantification algorithm so as to provide a measurement of said amount of said organic substance contained within said food product.